

Ceramics Notes

Ceramics is the art of making pottery or working with clay.

Clay:

- is naturally formed by the erosion or breaking down of the earth's surface
- is found worldwide
- is primarily made up of hydrated silicates of alumina
- can be found in creek beds and wet areas
- is plastic in nature and can easily be molded into forms
- blended clays are known as clay bodies.

In choosing a clay body, there are three basic considerations:
Firing Temperature, Texture, and Color & Glaze Response.

Firing Temperature

3 basic temperature ranges for clay bodies:

Earthenware Clay bodies —Cone 06–3 1850-2000°F/1000-1160°C

Mid Range Clay bodies —Cone 4–7 2160–2260°F/1160–1225°C

High Fire Clay bodies —Cone 6–10 2200–2400°F/1200–1300°C

Texture

- refers to the “feel” or “tooth” of the clay
- can be courser if ground fireclays, sand, or grog is added to the mix
- Potter’s usually prefer their wheel throwing clay to be smoother than their sculpture clay. This is simply a matter of preference, as wheel and sculpture clay can be used interchangeably by many potters.

Color & Glaze Response

Terra Cotta has a beautiful natural reddish-brown color, which is often times left unglazed. Other clays, such as porcelain, can be colored by adding oxides or stains. Every colored clay will cause a different glaze response.

TYPES OF CLAYBODIES:

Clay bodies are made up of many different kinds of clay, however some of the most common clay bodies are:

Earthenware:

- low fire clay that is usually reddish brown, gray, or white in color
- works well with throwing on the wheel and hand building because it is smooth

Stoneware:

- Higher firing clay than Earthenware, in the middle range
- can be used for hand building and throwing.
- usually groggier than Earthenware clay
- a little more expensive
- glazes are harder to control
- some stoneware clay bodies as well as glazes work better fired in a gas kiln to reach higher temperatures

Porcelain:

- middle range to high range of firing
- smooth in texture
- white in color
- works better with wheel thrown or casted from a mold
- because the clay body is so thin it is very hard to work with on the wheel
- much more expensive

Fire Clay:

- highest firing clay
- commonly used for insulating brick, hard firebrick, and kiln furniture
- firing of this clay takes a special gas kiln

5 Stages of Clay for a finished product:

STAGE #1 - GREENWARE:

- unfired clay
- can always be melted down and re-worked for usable clay

○ **Wet Clay:** In this stage clay can be easily manipulated and formed.

○ **Leather-hard:** In this stage the clay begins to dry out, leaving the body flexible and tough. You may use the slip and score method to attach pieces. Larger pieces may be easier to work with as leather-hard.

○ **Bone Dry:** In this stage, clay is much more fragile as the moisture is drawn out of the clay body. Piece can easily break, especially if not properly attached. You will not be able to attach pieces back together once the piece is completely dried out. Once completely dry it is ready to fire.

STAGE #2 - BISQUE FIRE: The first fire your piece will go through, roughly about 1900 degrees at the hottest point it will mature and harden the clay body. This fire takes roughly 24 hours from start to finish as it slowly heats and cools your piece.

STAGE #3 - BISQUE WARE: Ware that has been bisque fired and ready to be painted or glazed.

Once your piece has been fired, paint it with acrylic paint to be finished or glaze it to be fire again. Acrylic painted ware does not get re-fired, the piece is done once the paint dries.

STAGE #4 - GLAZE FIRE: The second and last fire your glazed piece will need to go through. This fire is a little cooler, about 1600 degrees yet still hot enough to melt and fuse the glass silicates in the glaze. This fire also takes about 2 days before the ware is cool enough to safely unload the kiln.

STAGE #5 - GLAZE WARE: Fired glazed ware.

PARTS OF A POT:

Lip / Rim: The top of your piece, sometimes distinct and different from the rest of the piece.

Belly: The main body of the piece, which could be used to hold something.

Foot: The base of the piece, usually a ring like base on a wheel thrown piece formed by tooling excess clay.

A Kiln

- bakes or "fires" pottery at very high temperatures to harden the clay and melt the glaze onto the surface of the pottery.
- varys in size and type
- could be very small to fire only very small jewelry pieces
- could be are as large as an entire room
- can be created for outdoor firings

A Pottery Wheel:

- helps to create symmetrical pieces.
 - can come in two main varieties: electric and kick wheel.
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- The term “throwing on the wheel” comes from the old English word “Thrawan” which means a twisting or spinning action, which creates an end product.

Cautions

Dry Clay in Powder form:

Long-term exposure to the silicates in the dry clay form can settle in your lungs and can cause multiple health problems such as cancer. Take caution to not stir up the clay dust in the air, including blowing clay dust off your bone-dry clay project and shaking clay mats.

Broom and Dust Pan:

Clean-up of clay dust or broken projects can be a breeze, don't forget to use these tools. Once done make sure to also use the pink spray cleaner and paper towels to clean your table area to keep all clay dust under control.



General Clay Techniques:

Joining pieces together: When joining pieces together in the leather-hard clay stage always remember to score (scratch up the surface) and apply slip (watery clay). Pieces may fall off if not properly attached. Make sure to smooth clay all around joined pieces.

When a piece is complete, let the piece slowly dry out to avoid cracking. You may want to cover the piece with a loose plastic bag for a day or so first. Then remove the bag to let it finish drying out.

To prevent warping and pieces from blowing up try to get all areas the same thickness of no more than ½ inch. Try to keep from making air pockets as you put clay pieces together. If you are wheel throwing- wedge clay first to get air bubbles out.

If a piece dries out more than you wanted it to, you have a couple options: Either spray the project with water and wrap lots of wet paper towels around the piece for 1-3 days or scrap the project and start again if you don't have days to wait. Make sure you plan ahead, if you want to keep working on a project, keep it wet and wrapped up.